



The Randomness of Rain

In Australia the Federal Government conducts a census of the population every 5 years. Many organisations rely on the data collected in the census to plan facilities and services for particular communities amongst other things.

A **census** is when all people in a target group are surveyed and often this is not possible or is impractical. Another way that data can be collected is in a **sample** where only part of the population is surveyed and the results used to draw conclusions about the whole population. Once the size of the **sample** has been determined, how it is to be selected also needs to be considered. A **biased** sample, one where the group does not represent the population, will lead to misleading results. To prevent bias is important that the sample is selected **randomly**. In a random sample every individual has an equal chance of being selected.

Task:

1. Name 2 ways that you know of that are used so that objects are selected fairly.

Often disputes arise when one person thinks that something has been done fairly while another thinks that it has been **biased**. The following task checks how fair you are by **simulating** rain falling on 25 squares of paving.

2. Imagine that 9 drops of rain have fallen onto the paving squares on the left. **Before** you read on, place the drops **randomly** where they may have fallen.
3. Describe how you ensured that your drops were **random**.

Comment on the following comparing your results with how rain might fall naturally.

4. Did any of your drops fall on the cracks?
5. Did more than one of your drops fall into any of the squares?
6. We can see that 16 out of the 25 squares are on the outer edge of the paved area.
This is more than half. From your 9 drops how many fell on the outside squares?



- 7.** Collect class results to show how many of the drops fell on the outside pavers and how many fell on the inside.

8. Repeat the activity, this time use your calculator to randomly select numbers from 1 to 25. For example, use $(\text{RAND} * 25 + 1)$.

Use the whole number part only to place a drop into its corresponding square.

9. Out of 9 drops, how many would you expect to fall randomly on the outside edge?

10. Revisit questions 4, 5 and 6

11 What was more “random” you or
